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10/722,602

11/28/2003

Kouji Mitsuhashi

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12/10/2008

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EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT

PAPER NUMBER

1792

NOTIFICATION DATE

DELIVERY MODE

12/10/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/722,602 | Applicant(s) MITSUHASHI ET AL. | |
| | Examiner RAKESH K. DHINGRA | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9,10,12,14,15,31,32 and 38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9,10,12,14,15,31,32 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/22/08 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 9, 10, 12, 14, 15, 31, 32 and 38 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

Applicant has amended claim 9 by adding new limitations "provided below a surface of the film and not provided on a surface of the main layer".

Claims 9, 10, 12, 14, 15, 31, 32 and 38 are presently pending and active.

New reference (JP 02-054780) when combined with O'Donnell et al reads on amended claim 9 limitations including the newly added limitation "provided below a surface of the film and not provided on a surface of the main layer".

Accordingly claims 9, 10, 15 have been rejected under 35 USC 103 (a) as explained below. Additionally, claims 12, 14, 31, 32 and 38 have also been rejected under 35 USC 103 (a) as explained below.

Regarding applicant's argument that the examiner has combined an excessive number of references for rejecting dependent Claims 14, 31 and 38, examiner responds that reliance on a

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large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

In this case, Bradley et al., Tokutake et al. and Mahulikar et al. have been cited for their teachings as recited in dependent claims 14, 31, 38 pertaining to anodic coating and its sealing by Group 3a element, or selected from the group consisting of SI (silicone), PTFE (polytetrafluoroethylene), PI, (polyimide), PAI (polyamideimide), PEI (polyetherimide), PBI (polybenzimidazole) and PFA (perfluoroalkoxyalkane).

Further, in view of amendment to claim 9 and new grounds of rejection of claim 9, the double patenting rejection of claims 9, 10 and 12 has been amended as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9, 10, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell et al (US 2005/015,0866) in view of Kosuge et al (JP 02-054780).

Regarding Claims 9, 10: O'Donnell et al teach an apparatus (Figures 4-6) that includes a focus ring 14 (an internal member of a plasma processing vessel), comprising:

aluminum (base material); and

a film formed on a surface of the base material, wherein the film has a main layer 100 formed by thermal spraying of yttria-containing coating (ceramic) and an intermediate coating (barrier coat layer) 80 formed of Al₂O₃ (ceramic) that can also be formed by thermal spraying. O'Donnell et al also teach that for aluminum components, an anodic coating is given as a barrier coating before the main coating, and which can be sealed [Paragraphs 0041, 0054, 0057, 0059, 0062-0066].

O'Donnell et al teach sealing of anodized surfaces but do not teach at least parts of pores inside the thermally sprayed barrier coat film are sealed by a resin provided below a surface of the film and not provided on a surface of the main layer.

Kosuge et al teach an apparatus for providing corrosion resistance to metal substrate comprising a metallic substrate 10 coated with a thermally sprayed barrier coat layer 11 and a thermally sprayed main layer 13 coated above the barrier coat layer 12. Kosuge et al further

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teach a resin sealing layer 12 provided below a surface of film 12 and not provided on a surface of the main layer 13 {Fig. 1 and Abstract (full translation of the document requested)}[claim limitation “provided below a surface of the film” is interpreted to imply that the resin sealing is provided below a surface of the main layer, that is, the resin sealing is provided only on the barrier coat layer, in line with applicant’s Figures 4A-4C and specification paragraphs 0065,0066. Applicant is invited to clarify/amend the claim].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the thermally sprayed film with a resin as taught by Kosuge et al in the apparatus of O’Donnell to fill the fine pores in the thermally sprayed layer and provide improved corrosion resistance to the internal member of the plasma processing vessel.

Regarding Claim 15: O’Donnell et al teach that main layer is formed of Ytria (Y₂O₃) {Paragraph 0041}.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over O’Donnell et al (US 2005/015,0866) in view Kosuge et al (JP 02-054780) as applied to Claims 9, 10, 15 and further in view of George et al (US 4,357,387).

Regarding Claim 12: O’Donnell et al in view of Kosuge et al teach all limitations of the claim including sealing of pores in the barrier coat layer by a resin.

O’Donnell et al in view of Kosuge do not teach sealing the barrier coat layer using a resin selected from the group consisting of SI (silicone), PTFE (polytetrafluoroethylene), PI (polyimide), PM (polymideimide), PEI (polyetherimide), PBI (polybenzimidazole) and PFA (perfluoroalkoxyalkane).

George et al teach sealing of thermally sprayed refractory (includes ceramic) coating using resins including polyimide resin (col. 2, lines 55-65 and col. 7, lines 10-50).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the barrier coat layer using polyimide resin as taught by George et al in the apparatus of O'Donnell et al in view of Kosuge et al obtain proper adhesion of barrier coat layer with the base material.

Claim 31, 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell et al (US PG PUB No. 2005/015, 0866) in view of Kosuge et al (JP 02-054780) as applied to Claims 9, 10, 15 and further in view of Bradley et al (US 4,310,390) and Tokutake et al (US 6,120,955).

Regarding Claims 31,38: O'Donnell et al in view of Kosuge et al teach all limitations of the claim (as explained above under claim 9) including that main coating is formed of Y₂O₃ and an anodized film can be formed between base material and the coating (film), and that anodized layer can be sealed {O'Donnell - paragraph 0043}.

O'Donnell in view of Kosuge do not teach parts of pores inside the anodic oxidized film are sealed by a second resin selected from the group consisting of SI (silicone), PTFE (polytetrafluoroethylene), PI (polyimide), PAI (polyamideimide), PEI (polyetherimide), PBI (polybenzimidazole) and PFA (perfluoroalkoxyalkane).

Bradley et al teach an apparatus where anodized coatings are sealed using organic polymers solutions for sealing the pores in the anodic coating to improve resistance to corrosive environments (col. 1, lines 15-45 and col. 4, lines 25-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal anodized layer using organic polymers as taught by Bradley et al in the apparatus of O'Donnell et al in view of Kosuge et al to obtain improved corrosion resistance for aluminum substrates.

O'Donnell et al in view of Kosuge et al and Bradley et al teach that anodic coating can be sealed using organic resins but do not do not teach that the resin is selected from the group consisting of SI (silicone), PTFE (polytetrafluoroethylene), P1 (polyimide), PAI (polyamideimide), PEI (polyetherimide), PBI (polyberlzimidazole) and PFA (perfluoroalkoxyalkane). Use of silicone based resin for sealing the pores in an anodic oxidized film is known in the art

Tokutake et al teach an apparatus (Fig. 1) that includes a substrate 1 that is anodized. Tokutake et al further teach that since the anodized layer has a porous portion, the same is sealed using polyimide resin (col. 3, lines 55-60 and col. 6, lines 59-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use polyimide resin for sealing the pores in the anodized layer as taught by Tokutake et al in the apparatus of O'Donnell et al in view of Kosuge et al and Bradley et al to improve the durability of anodized layer.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell et al (US 2005/015, 0866) in view of Kosuge et al (JP 02-054780), Bradley et al (US 4,310,390) and Tokutake et al (US 6,120,955) as applied to Claims 31, 38 and further in view of Mahulikar et al (US 5,534,356).

Regarding Claim 14: O'Donnell et al in view of Kosuge et al, Bradley et al and Tokutake et al teach all limitations of the claim except that sealing treatment of anodic layer is executed using an element of Group 3a in the periodic table.

Mahulikar et al teach an apparatus (Figs. 1, 2) where a substrate 12 is anodized (layer 14) and which is then sealed against pores using an aqueous solution comprising of boric acid (contains Boron – group 3a element) [col. 3, line 20 to col. 5, line 8].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a group 3a element for sealing of anodic layer as taught by Mahulikar et al in the apparatus of O'Donnell et al in view of Kosuge et al, Bradley et al and Tokutake et al to prevent corrosion from chemicals used for subsequent processing like metallization (column 4, lines 58-68).

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell et al (US 2005/015,0866) in view of Kosuge et al (JP 02-054780) as applied to Claims 9, 10, 15 and further in view of Horita et al (US 5,892,278).

Regarding Claim 32: O'Donnell et al in view of Kosuge et al teach all limitations of the claim (as explained above under claim 9 above) and further including that main coating is formed of Y₂O₃ and an anodized film can be formed between base material and the coating (film) and that anodized layer can be sealed {O'Donnell - paragraph 0043}.

O'Donnell et al in view of Kosuge et al do not teach that pores in the anodic oxidized film are sealed by an aqueous solution of metal salt.

Horita et al teach a method (Figs. 1, 2) that includes formation of anodic oxidized film on semiconductor chip radiator 1 and where the anodic film is sealed in a nickel salt solution in water (col. 5, line 50 to col. 6, line 10).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the pores in the anodic oxidized film by using an aqueous solution of metal salt as taught by Horita et al in the apparatus of O'Donnell et al in view of Kosuge et al to enable clog micropores in the anodic oxidized film (Column 5, lines 60-65).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 9, 10, 12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 17-20 of copending Application No. 10/773,245 (US PG PUB No. 2005/0103275) in view of O'Donnell et al (US PG PUB No. 2005/0150866) and Kosuge et al (JP 02-054780).

Claims 5, 17-20 of co-pending application teach:

A ring member (an internal member) of a plasma processing vessel, comprising:
a base material; and a film formed on a surface of the base material, wherein the film has a main layer formed by thermal spraying of ceramic and a barrier coat layer formed of ceramic including an element selected from the group consisting of B, Mg, Al, Si, Ca, Cr, Y, Zr, Ta, Ce and Nd;
wherein the barrier coat layer is a thermally sprayed film and at least parts of pores inside the thermally sprayed film are sealed by a resin;

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wherein the barrier coat layer is formed of at least one kind of ceramic selected from the group consisting of BaC, MgO, Al₂O₃, SiC, Si₃N₄, SiO₂, CaF₂, Cr₂O₃, Y₂O₃, YF₃, ZrO₂, TaO₂, CeO₂, Ce₂O₃, CeF₃ and Nd₂O₃; and

wherein the resin is selected from the group consisting of SI (silicone), PTFE (polytetrafluoroethylene), PI (polyimide), PAI (polyamideimide), PEI (polyetherimide), PBI (polybenzimidazole) and PFA (perfluoroalkoxyalkane).

Claims 5, 17-20 of co-pending application do not teach the barrier coat layer is an intermediate layer formed between the main layer and the base material and the sealing layer is provided below a surface of the film and not provided on a surface of the main layer.

O'Donnell et al teach an apparatus (Figures 4-6) that includes a focus ring 14 (an internal member of a plasma processing vessel), comprising:

aluminum (base material); and

a film formed on a surface of the base material, wherein the film has a main layer 100 formed by thermal spraying of yttria-containing coating (ceramic) and an optional intermediate coating (barrier coat layer) 80 formed of Al₂O₃ (ceramic) that can also be formed by thermal spraying. [Paragraphs 0041, 0054, 0057, 0059, 0062-0066].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to form a barrier coat layer formed between the main layer and the base member as taught by O'Donnell et al in the apparatus of claims 5, 17-20 of co-pending application to obtain an optional pre-coating before forming ceramic coating, as per process limitations (paragraph 0062).

Claims 5, 17-20 of co-pending application in view of O'Donnell et al do not teach the sealing layer is provided below a surface of the film and not provided on a surface of the main layer.

Kosuge et al teach an apparatus for providing corrosion resistance to metal substrate comprising a metallic substrate 10 coated with a thermally sprayed barrier coat layer 11 and a thermally sprayed main layer 13 coated above the barrier coat layer 12. Kosuge et al further teach a resin sealing layer 12 provided below a surface of film 12 and not provided on a surface of the main layer 13 [Abstract (full translation of the document requested)].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the thermally sprayed film with a resin provided below a surface of the film and not provided on a surface of the main layer as taught by Kosuge et in the apparatus of Claims 5, 17-20 of the co-pending application in view of O'Donnell et al to fill the fine pores in the thermally sprayed layer and provide improved corrosion resistance to the internal member of the plasma processing vessel.

This is a provisional obviousness-type double patenting rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAKESH K. DHINGRA whose telephone number is (571)272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Rakesh K Dhingra/
Examiner, Art Unit 1792

/K. M./
Primary Examiner, Art Unit 1792